Title: EASY SOFTWARE UPGRADE

Abstract: There is provided a television device (102) and a portable memory device (110). The portable memory device is operatively connected to the television device (102). The television device recognizes the portable memory device and writes to the portable memory device a small file stating identification information. The portable memory device is then operatively connected to a third device (116). Automatically an application starts, which checks for a firmware upgrade item for the television device and, if available, downloads this firmware. When completely loaded the portable memory device is removed from the third device and connected to the television device. The television device detects that new firmware is present on the portable memory device and upgrades itself with that firmware.

FIG. 1a
Declarations under Rule 4.17:

as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

Published:

with international search report (Art. 21(3))
Easy software upgrade

TECHNICAL FIELD

The present invention relates to a device, and more particularly to a device arranged for receiving firmware upgrade, and a method thereof.

BACKGROUND ART

Previously, consumer electronics devices, such as television devices, could not be upgraded by a user installing a firmware upgrade. Thus the user was forced to buy a newer model if a device comprising newer firmware was desired.

However state-of-the-art multimedia devices such as television devices, audio devices and Digital Versatile Disc (DVD) players nowadays often provide the possibility of being upgrade with firmware. It is often required that the firmware is downloaded by a user, wherein the user further is required to first burn the firmware onto a Compact Disc (CD) and then to load the CD into the device.

If a firmware of the television device needed to be upgraded the user would then connect the television device to an upgrading device, such as a computer, via a RS232 port. The process was often cumbersome and involved a serviceman to be present for carrying out the upgrading process since the firmware usually was not publicly available. The serviceman thus brought the computer with the firmware from one location to another.

Large consumer electronics devices (e.g. Television devices) nowadays allow for software upgrade using a Universal Serial Bus (USB) flash drive. In this situation the user is required to first manually download the firmware upgrade, e.g. from the Internet, then to put the firmware upgrade on a USB flash drive, and finally to connect the USB flash drive to the television device for the television device to be upgraded.

The US patent application 2002/0043938 discloses a method and apparatus for conveniently updating firmware within a television device or desktop computer monitor using a USB port. The updated firmware is transferred to the television device from a USB memory device.
SUMMARY OF THE INVENTION

A number of disadvantages of the cited art has been identified in light of the present invention. As stated above the US patent application 2002/0043938 discloses a method wherein updated firmware is transferred to the television device from a USB memory device. However a problem with the existing USB upgrade process, as disclosed in 2002/0043938, is that the user is required to perform a number of actions.

If the firmware upgrade is available on the Internet the user typically first needs to start a web browser. Secondly the user needs to find the webpage which contains the firmware upgrade for the specific device to be upgraded. The user is then further required to select the proper firmware upgrade (as there could be different versions, e.g. for different models or language types), and then to download the software onto a USB memory device.

This is an error prone process, as the user may not find the correct webpage. The user may download the firmware for a wrong version. In addition, the user might be unable to find the correct upgrade. Further, the user needs to decide if the version of the found firmware update is indeed a newer version of the currently installed firmware.

In view of the above, an objective of the invention is to solve or at least reduce the problems discussed above. One object is to provide an apparatus and method which allows for autonomous upgrade of firmware in a device. Generally, the above objectives are achieved by the attached patent claims.

According to a first aspect of the present invention there is thus provided a first device arranged for receiving at least one firmware upgrade item, wherein the device comprises connecting means for connecting to a portable memory device, a memory comprising identification information of the device, and a controller, wherein the controller is arranged to recognize the portable memory device when the portable memory device is operatively connected to the first device via the connecting means; to provide the portable memory device with said identification information; and to receive at least one firmware upgrade item from the portable memory device, wherein the at least one firmware upgrade item depends on said identification information.

The term recognizing could here be interpreted as detecting the presence of the portable memory device, for instance by using communications protocols, wherein the communications protocols depend on the connecting means. For example if the portable memory device is a Universal Serial Bus flash drive, the communications protocol will be a communications protocol associated with the Universal Serial Bus flash drive.
The term recognizing may also be interpreted as identifying the portable memory device by receiving identification information from the portable memory device and comparing the received identification information with identification information stored in a memory of the first device.

That is, the first device arranged for receiving at least one firmware upgrade item is first operatively connected to a portable memory device. When a connection has been established between the first device and the portable memory device the first device recognizes the portable memory device as outlined above.

When the first device has recognized the portable memory device the first device may provide the portable memory device with identification information of the first device. In a case the portable memory device comprises at least one firmware upgrade item the first device may receive the at least one firmware upgrade item from the portable memory device.

If the portable memory device does not comprise at least one firmware upgrade item the portable memory device is then operatively disconnected from the first device in order for the portable memory device to be able to receive at least one firmware upgrade item, as will be further disclosed below. Alternatively, the first device may transmit new identification information to the portable memory device before the portable memory device is disconnected. After the portable memory device has been provided with at least one firmware upgrade item, the portable memory device can be operatively connected to the first device yet again for the first device to receive the at least one firmware upgrade item from the portable memory device.

As will be further disclosed below, the at least one firmware upgrade item depends on the identification information of the first device. The identification information may inter alia be used to find a correct version of the firmware upgrade.

The first device may be a television device. Alternatively the first device may be a player for multimedia. Yet alternatively the first device may be a recorder for multimedia. Or alternatively the first device may be a combined player and recorder for multimedia.

The memory in the first device may further comprise at least one existing firmware item and the controller may further be arranged to replace the at least one existing firmware item with the at least one firmware upgrade item.

The identification information may comprise a first version of a latest installed firmware. The at least one firmware upgrade item may comprise a second version and the at
least one firmware upgrade item is only received in case the second version is an upgrade of
the first version.

The identification information may comprise a model number of the first
device.

The identification information may comprise a digital signature of the first
device.

The identification information may comprise a version number of the latest
installed firmware.

The identification information may be a combination of elements. Elements in
the identification information may thus be model number and version number. In the case
where the firmware consists of multiple components, such as firmware items, there may exist
a component identification information (e.g. a name or number) and for each component a
version number.

According to a second aspect of the present invention there is also proposed a
mechanism that launches an application from a portable memory device, which application
automatically downloads firmware to the portable memory device. For example, when a
portable memory device is operatively connected to a first device, which may be a first
device according to the first aspect, the portable memory device is recognized by the first
device. The portable memory device may then receive identification information of the first
device. If the portable memory device already comprises firmware upgrade the firmware
upgrade may be downloaded to the first device. This automates the navigation to and
downloading of the firmware. Thus there is provided a portable memory device arranged for
upgrading firmware in a first device, wherein the portable memory device comprises
connecting means adapted for connection with a first device and a third device, wherein the
portable memory device further comprises a memory comprising recognition information and
a mechanism for providing the first device with the recognition information when the first
device is operatively connected to the portable memory device via the connecting means;
receiving identification information from the first device; requesting at least one firmware
upgrade item based on said identification information when the portable memory device is
operatively connected to the third device via the connecting means; receiving at least one
firmware upgrade item from the third device; and wherein the memory is further configured
to store the at least one firmware upgrade item; wherein the mechanism provides the at least
one firmware upgrade item to the first device.
Preferably, the mechanism consists of the portable memory device comprising computer program code, wherein the computer program code, when executed on a controller, performs the steps of the mechanism. As an alternative, the mechanism may comprise a file stored in the memory device that is recognized by the respective first and third devices, such as the existence of a file, e.g. a file called ‘autorun.inf’ providing information or instructions for the respective first and third devices. That is, the computer program code may be associated with instructions to establish a connection with the first device or the third device, respectively. The memory may further comprise at least one initial firmware upgrade item.

The portable memory device may be a Universal Serial Bus flash drive. Alternatively the portable memory device may be a memory stick. Alternatively the portable memory device may be a CD. Alternatively the portable memory device may be a DVD. Alternatively the portable memory device may be a compact flash memory. Alternatively the portable memory device may be an SD card. Alternatively the portable memory device may be a Blue Ray Disk.

According to a third aspect of the present invention there is provided a method in which a first device recognizes a portable memory device and writes to the portable memory device a small file stating identification information. The portable memory device is then operatively connected to a third device. Automatically, for example by executing an autorun.inf script, an application starts, which checks for a firmware upgrade item for the first device and, if available, downloads this firmware. Alternatively the portable memory device may simulate a memory device which is allowed to auto run when operatively connected to the third device. For example a compact disc (CD) may be allowed to auto run when inserted into the CD reader of a computer. Thus when being operatively connected to a computer the portable memory device may simulate a compact disc. Alternatively, when being operatively connected to the third device, a notification could be given to a user, wherein the notification comprises a message stating that the portable memory device is operatively connected to the third device. Optionally this notification could also allow a user to perform an action, wherein the action may be to search or download a firmware upgrade item from the third device to the portable memory device. When completed the portable memory device is removed from the third device and connected to the first device. The first device detects that new firmware is present on the portable memory device and upgrades itself with that firmware.

There is thus provided a method for enabling upgrading firmware in a first device, wherein the method comprises the steps of: providing the portable memory device
with identification information when operatively connected through connection means to the
first device; receiving at least one firmware upgrade item from the portable memory device,
wherein the at least one firmware upgrade item depends on said identification information;
and replacing at least one existing firmware item with the at least one firmware upgrade item.

The identification information may comprise an address and the at least one firmware
upgrade item may be requested by providing the address to the portable memory
device.

The address may comprise a Uniform Resource Locator.

Before being received by the first device the at least one firmware upgrade item may be requested, based on the identification information, by the portable memory
device when the portable memory device is operatively connected to a third device; received
by the portable memory device from a third device; and stored (306) in the portable memory
device.

These and other aspect of the invention will be apparent from and elucidated
with reference to the embodiments described hereinafter.

Generally, all terms used in the claims are to be interpreted according to their
ordinary meaning in the technical field, unless explicitly defined otherwise herein. All
references to "a/an/the/said [element, device, component, means, step, etc]" are to be
interpreted openly as referring to at least one instance of said element, device, component,
means, step, etc., unless explicitly stated otherwise. The steps of any method disclosed herein
do not have to be performed in the exact order disclosed, unless explicitly stated.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of the present invention will become apparent
from the following detailed description of a presently preferred embodiment, with reference
to the accompanying drawings, in which:

Fig. 1(a) shows a system according to an embodiment;
Fig. 1(b) shows a system according to an embodiment;
Fig. 2 shows a flowchart for a method according to an embodiment;
Fig. 3 shows a flowchart for a method according to an embodiment.

DETAILED DESCRIPTION OF THE EMBODIMENTS

The present invention will now be described more fully hereinafter with
reference to the accompanying drawings, in which certain embodiments of the invention are
shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided by way of example so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout.

Fig. 1(a) shows a system 100 in which the invention may readily apply. The system 100 comprises a first device 102, a portable memory device 110 and a third device 116. The first device 102 comprises a connecting means 104 to which the portable memory device 110 may be connected. According to one embodiment the connecting means 104 is a USB port. The first device 102 further comprises a controller 108 and a memory 106. The memory 106 is advantageously a PROM, an EEPROM, or another suitable non-volatile memory for storing program instructions, such as firmware items, and other data used by the controller 108. The controller 108 is thus arranged to control the flow of data to/from the memory 106, from/to either the connecting means 108 or from/to other internal entities of the first device 102 which are not shown. Other components which may be part of the of the first device, such as a tuner, a display screen, a user interface, etc. are well known in the art and are not further elaborated on.

In the below the first device 102 will be exemplified by a television device. However, in general the first device may be embodied by any suitable electronic device, such as an any player and/or recorder for multimedia, which device comprises firmware and which is arranged for receiving a firmware upgrade. The first device may thus alternatively be one from the group of a CD player and/or recorder, a DVD player and/or recorder and a Blue-Ray Disk player and/or recorder, assuming that the device is arranged for receiving a firmware upgrade.

A portable memory device 110, preferably a USB memory stick, comprises a connecting means 112 and a memory 114. The portable memory device 110 may thus be connected to the television device 102 via the connecting means 104 of the television device 102 and the connecting means 112 of the portable memory device 110. The portable memory device 110 may also be connected to the connecting means 118 of a third device 116 via the connecting means 112. It is also possible that the portable memory device 110 utilizes different connecting means 112 when it is operatively connected to the first device 102 and the third device 116. That is, the portable memory device 110 may simultaneously comprise USB memory stick connecting means 112 for communications with the first device 102 and network cable connecting means 112 for communications with the third device 116.
The third device 116 is preferably a computer. As is known to the skilled person a computer comprises a number of components (not shown in Fig. 1(a)) such as one or several types of memories and one or several types of processors, such as a Central Processing Unit (CPU). The third device 116 may be operatively connectable to a network 120, such as a Local Area Network (LAN) or a Wide Area Network (WAN), such as the Internet.

A user may upgrade the firmware of the television device 102 by using the portable memory device 110. A firmware upgrade item is here defined as an upgraded component of the firmware currently installed on the television device 102. The term firmware upgrade item is used since, as is known to the skilled person, the firmware may comprise a number of components, which components may be updated separately. In such a case the entire firmware does not have to be downloaded in order to upgrade the television device 102; instead just the updated firmware item(s) or component(s) need to be downloaded and installed in order to properly upgrade the television device 102.

If the portable memory device 110, according to a first scenario, initially has a firmware upgrade item stored in its memory 114 a user, or operator, can connect the portable memory device 110 to the television device 102 by connecting, schematically indicated by the arrow 122 in Fig. 1(a), the connecting means 112 of the portable memory device 110 to the connecting means 104 of the television device 102. When the portable memory device 110 and the television device 102 are operatively connected the television device 102 senses the presence of the portable memory device 110. Since the portable memory device 110 comprises a firmware upgrade item stored in its memory 114 the television device 102 may recognize the portable memory device 110 as a device comprising a firmware upgrade item.

Alternatively, a user may manually, by using a user interface of the television device 102, provide the television device 102 with instructions to initiate the television device 102 to search for a new firmware upgrade item comprised in the portable memory device 110.

If the controller 108 of the television device 102 finds that the firmware upgrade item of the portable memory device 110 corresponds to a firmware upgrade item suitable for the television device 102, e.g. by checking a version number or a model reference comprised in the firmware upgrade item the controller 108 initiates a downloading phase of the firmware upgrade item from the portable memory device 110 to the memory 106 of the television device 102. If the download is successfully completed the stored firmware upgrade item may be installed in the television device 102 and thereby update the firmware of the
television device 102. When the firmware upgrade has been downloaded from the portable memory device 110 to the television device 102 the user may remove the portable memory device 110 from the television device 102.

According to a second scenario the portable memory device 110 does not initially comprise a firmware upgrade item stored in its memory 114. A user, or operator, then connects the portable memory device 110 to the television device 102 according to the procedure outlined above. The television device 102 then senses the presence of the portable memory device 110. Since television device 102 senses that the memory 114 of the portable memory device 110 does not comprise a firmware upgrade item the television device 102 provides the portable memory device 110 with identification information, such as a version number of the latest installed firmware, a digital signature or a model reference of the television device 102. The identification information may be a combination of elements. Elements in the identification information may thus be model number, a digital signature and version number. In the case where the firmware consists of multiple components, such as firmware items, there may exist a component identification information (e.g. a name or number) and for each component a version number. This information is stored in the memory 114 of the portable memory device 110. The user may then remove the portable memory device 110 from the television device 102 and connect the connecting means 112 of the portable memory device 110 to the connecting means 118 of a third device 116, as schematically indicated by the arrow 124 in Fig. 1(a).

When the portable memory device 110 is operatively connected to the third device 116 the portable memory device 110 initiates an automatic search for a firmware upgrade item e.g. by running a search script on a processor of the third device 116. That is, when the portable memory device 110 is operatively connected to the third device 116 the third device 116 detects the presence of the portable memory device 110 and automatically starts to run an application stored on the portable memory device 110. However, if the third device 116 does not support automatically running an application when an external device, such as the portable memory device 110, is operatively connected to the third device 116 the application has to be initialized by a user or operator of the third device 116.

The searched firmware upgrade item is based on the information pertaining to the television device 102 stored in the memory 114 of the portable memory device 110. Thus the identification information may comprise an address and the firmware upgrade item may be requested by providing the address to the third device. The firmware upgrade item may be searched for on the third device 116 itself. Alternatively the firmware upgrade item may be
searched for on a network 120 such as the Internet, to which network the third device 116 is operatively connected. In such a case the address may comprise a Uniform Resource Locator (URL) to an Internet webpage.

If a firmware upgrade item is found, it may be downloaded to the memory 114 of the portable memory device 110. After successful download procedure the user then removes the portable memory device 110 from the third device 116 and then operatively connects the portable memory device 110 to the television device 102. The firmware upgrade may then be downloaded to and properly installed on the television device 102 according to the procedure as disclosed above for the case when the memory 114 of the portable memory device 110 initially comprised a firmware upgrade.

However, if the controller 108 of the television device 102 for some reason detects that the firmware upgrade item is not a proper firmware upgrade item the controller 108 may decide neither to download nor to install the firmware upgrade item. This might be the case if the television device 102 has already been upgraded with the latest version of the firmware, or if for some reason the portable memory device 110 has stored the wrong firmware upgrade item.

Fig. 1(b) shows a system 150 in which the invention may readily apply. The system 150 comprises a television device 102, a portable memory device 128 and a third device 116. As in Fig. 1(a) the television device 102 comprises a controller 108 and a memory 106. The television device 102 of Fig. 1(b) further comprises a digital media reader and writer 126, such as a CD reader/writer or a DVD reader/writer. In this case the portable memory device 128 is preferably a readable/writable CD or a readable/writable DVD. Alternatively the portable memory device may be a compact flash memory. Alternatively the portable memory device may be an SD card. Alternatively the portable memory device may be a Blue Ray Disk. Thus the television device 102 of Fig. 1(b) further comprises a digital media reader and writer 126 supporting the same format as the format of the portable memory device.

The third device 116 is preferably a computer comprising a digital media reader and writer 130, such as a CD reader/writer or a DVD reader/writer. Thus the third device 116 of Fig. 1(b) further comprises a digital media reader and writer 130 supporting the same format as the format of the portable memory device.

The portable memory device 128 may thus be inserted into the digital media reader and writer 126 of the television device 102 as schematically indicated by the arrow
132. The portable memory device 128 may further be inserted into the digital media reader and writer 130 of the third device 116 as schematically indicated by the arrow 134.

The procedure to upgrade the firmware of the television device 102 is similar to the procedures as disclosed with reference to Fig. 1(a), with the difference that according to the scenario of Fig. 1(b) the portable memory device 128 is inserted into a digital media reader comprised in the television device 102 and the third device 116. That is, if the portable memory device 128 initially comprises a stored firmware upgrade item a user, or operator, can insert the portable memory device 128 into the digital media reader and writer 126 of the television device 102. When the portable memory device 128 has been properly inserted the television device 102 senses the presence of the portable memory device 128. Since, according to one embodiment, the portable memory device 128 comprises a stored firmware upgrade item the television device 102 may recognize the portable memory device 128 as a device comprising a firmware upgrade item. The controller 108 may then initiate a download procedure as disclosed above.

According to another scenario the portable memory device 128 does not initially comprise a firmware upgrade item. A user, or operator, then inserts the portable memory device 128 into the television device 102 according to the procedure outlined above. The television device 102 then senses the presence of the portable memory device 128. Since television device 102 senses that the portable memory device 128 does not comprise a firmware upgrade item the television device 102 provides the portable memory device 128 with identification information, such as a version number of the latest installed firmware or a model reference of the television device 102. This information is stored in the portable memory device 128. The user may then remove the portable memory device 128 from the television device 102 and insert the portable memory device 128 into the third device 116, as schematically indicated by the arrow 134 in Fig. 1(b).

When the portable memory device 128 has been properly inserted into the third device 116 the portable memory device 128 initiates the third device 116 to automatically search for a firmware upgrade item e.g. by running a search script on a processor of the third device 116, wherein the searched firmware upgrade item is based on the information pertaining to the television device 102 stored in the portable memory device 128. Thus the identification information may comprise an address and the firmware upgrade item may be requested by providing the address to the third device. The firmware upgrade item may be searched for on the third device 116 itself. Alternatively the firmware upgrade item may be searched for on a network 120 such as the Internet, to which network the third
device 116 is operatively connected. In such a case the address may comprise a Uniform Resource Locator (URL) to an Internet webpage.

If a firmware upgrade item is found, it may be downloaded to the portable memory device 128. After successful download procedure the user then ejects the portable memory device 128 from the third device 116 and then inserts the portable memory device 128 into the television device 102. The firmware upgrade may then be downloaded to and properly installed on the television device 102 according to the procedure as disclosed above for the case when the portable memory device 128 initially comprised a firmware upgrade.

With reference to Fig. 2 a method for upgrading firmware in a television device, such as the television device 102 of Fig. 1(a) or Fig. 1(b) will be disclosed. In a recognition step 202 the television device 102 recognizes a portable memory device, such as the portable memory device 110 of Fig.1(a) or the portable memory device 128 of Fig. 1(b), when the portable memory device 110, 128 is operatively connected to the television device. The television device 102 may recognize the portable memory device 110, 128 by reading information provided in the memory of the portable memory device. This information may pertain to identification information of the portable memory device. Alternatively this information may pertain to a firmware upgrade item comprised in the memory of the portable memory device.

The television device 102 then provides 204 the portable memory device with identification information. The identification information may comprise a model number of the television device. Alternatively the identification information may comprise a version number of the latest installed firmware. The identification information may alternatively, or also, comprise an address and at least one firmware upgrade item may be requested by providing the address to the portable memory device, which then provides the address to a third device comprising the at least one firmware upgrade item. An example of such an address is an address comprising a Uniform Resource Locator (URL) to an Internet webpage on the World Wide Web (WWW).

The television device 102 then receives 206 at least one firmware upgrade item from the portable memory device. The at least one firmware upgrade item depends on said identification information.

After reception the television device 102 replaces 208 at least one existing firmware item with the at least one firmware upgrade item, thereby upgrading the firmware of the television device 102. The at least one existing firmware item may comprise a first version and the at least one firmware upgrade item may comprises a second version and the
at least one existing firmware item may only be replaced in a case the second version is an upgrade of the first version. As is known to the skilled person a firmware is associated with a version of the firmware, such as a version identifier. In the simplest case the version identifier corresponds to the time of conception of the firmware. In other cases the firmware may explicitly provided with a version identifier, such as a version number, a version letter, or a version name. As is known to a skilled person, by comparing the version identifiers of the firmware’s it can be deduced which firmware of the compared firmware’s is the upgrade version of the other firmware.

Fig. 3 shows a flowchart for a method for handling a firmware upgrade item according to an embodiment. Before being received by the television device the at least one firmware upgrade item is requested 302, based on the identification information, by the portable memory device when the portable memory device is operatively connected to a third device 116. The at least one firmware upgrade item is further received 304 by the portable memory device from the third device. Furthermore the at least one firmware upgrade item stored 306 in the portable memory device.

The invention has mainly been described above with reference to a few embodiments. However, as is readily appreciated by a person skilled in the art, other embodiments than the ones disclosed above are equally possible within the scope of the invention, as defined by the appended patent claims.
CLAIMS:

1. A first device (102) arranged for receiving at least one firmware upgrade item, the first device comprising:
   - a connecting means (104) adapted for connection with a portable memory device (110);
   - a memory (106) comprising identification information of the first device; and
   - a controller (108) arranged to:
     - recognize the portable memory device when the portable memory device is operatively connected to the first device via the connecting means;
     - provide the portable memory device with said identification information; and
     - receive at least one firmware upgrade item from the portable memory device, wherein the at least one firmware upgrade item depends on said identification information.

2. The first device according to claim 1, wherein the first device is a device from the group of a television device, a player for multimedia, a recorder for multimedia, a combined player and recorder for multimedia.

3. The first device according to claim 1, wherein
   - the memory further comprises at least one existing firmware item; and wherein
   - the controller is further arranged to replace the at least one existing firmware item with the at least one firmware upgrade item.

4. The first device according to claim 1, wherein
   - the identification information comprises a first version of a latest installed firmware;
   - the at least one firmware upgrade item comprises a second version; and
   - the at least one firmware upgrade item is only received in case the second version is an upgrade of the first version.
5. The first device according to claim 1, wherein the identification information comprises at least one of a model number of the first device and a version number of the latest installed firmware.

6. A portable memory device (110) arranged for upgrading firmware in a device, comprising:
   - a connecting means (112) adapted for connection with a first device (102) and a third device (116);
   - a memory (114) comprising recognition information and a mechanism for
     - providing the first device with the recognition information when the first device is operatively connected to the portable memory device via the connecting means;
     - receiving identification information from the first device;
     - requesting at least one firmware upgrade item based on said identification information when the portable memory device is operatively connected to the third device via the connecting means;
     - receiving at least one firmware upgrade item from the third device;
   and wherein
   - the memory is further configured to store the at least one firmware upgrade item; and the mechanism further provides the at least one firmware upgrade item to the first device.

7. The device according to claim 6, wherein the mechanism consists of the portable memory device comprising computer program code, wherein the computer program code, when executed on a controller, performs the steps of the mechanism.

8. The device according to claim 6, wherein the mechanism comprises a file stored in the memory device that is in operation recognized by the respective first and third devices.

9. The portable memory device according to claim 6, wherein the memory further comprises at least one initial firmware upgrade item.

10. The portable memory device according to claim 9, wherein the portable memory device is a Universal Serial Bus flash drive.
11. A method for upgrading firmware in a first device (102), the method comprising the steps of:
   - recognizing (202) a portable memory device (110) when the portable memory device is operatively connected to the first device;
   - providing (204) the portable memory device with identification information;
   - receiving (206) at least one firmware upgrade item from the portable memory device, wherein the at least one firmware upgrade item depends on said identification information; and
   - replacing (208) at least one existing firmware item with the at least one firmware upgrade item.

12. The method according to claim 11, wherein
   - the at least one existing firmware item comprises a first version;
   - the at least one firmware upgrade item comprises a second version; and
   wherein
   - the at least one existing firmware item is only replaced in a case the second version is an upgrade of the first version.

13. The method according to claim 11, wherein the identification information comprises at least one of a model number of the first device and a version number of the latest installed firmware.

14. The method according to claim 11, wherein
   - the identification information comprises an address, preferably a Uniform Resource Locator; and wherein
   - the at least one firmware upgrade item is requested by providing the address to the portable memory device.

15. The method according to claim 14, wherein the at least one firmware upgrade item before being received by the first device is
   - requested (302), based on the identification information, by the portable memory device when the portable memory device is operatively connected to a third device (116);
- received (304) by the portable memory device from a third device;
- stored (306) in the portable memory device.
START

Recognize portable memory device

Provide identification information

Receive firmware upgrade

Replace existing firmware

STOP

FIG. 2
START

Request firmware upgrade item 302

Receive firmware upgrade item 304

Store firmware upgrade item 306

STOP

FIG. 3
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

INV.  G06F9/445

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
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<tbody>
<tr>
<td>X</td>
<td>WO 2008/026133 A (KONINKL PHILIPS ELECTRONICS NV [NL]; GROVER RAJESH [SG]; STEENBLIK JER) 6 March 2008 (2008-03-06) the whole document</td>
<td>1-15</td>
</tr>
</tbody>
</table>

| Check Box | Further documents are listed in the continuation of Box C. | See patent family annex. |

**Document**

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another document or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

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